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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,486	04/18/2002	Timothy P. Weihs	13631-2A	7867

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT PAPER NUMBER

1753

DATE MAILED: 01/15/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/846,486

Applicant(s)

WEIHS ET AL.

Examiner

Steven H VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) 13-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-12 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-12 in Paper No. 6 is acknowledged.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 50-54 (see page 14, lines 13-14). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 85 (See Figure 8). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

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The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The abstract of the disclosure is objected to because the abstract is greater than 150 words long. Correction is required. See MPEP § 608.01(b).

6. The disclosure is objected to because of the following informalities: the serial numbers need inserted on page 1, lines 11 and 13; "know" should be "known" on page 18, line 7.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-6 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,490,911 to Makowiecki et al. (Makowiecki) in view of US 3,729,046 to Kennedy et al. (Kennedy).

9. In claim 1, Applicant requires a method of making a freestanding reactive multilayer foil composed of a plurality of layers comprising the steps of providing a substrate, vapor depositing the alternating layers, and separating the foil from the substrate.

10. Makowiecki discloses a method of forming a multilayer foil (Abstract) comprising providing a substrate (col. 4, l. 10-14) and vapor depositing alternating layers on the substrate (col. 2, l. 50-53). The foil can react exothermically (col. 4, l. 30-47).

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11. Makowiecki does not disclose separating the foil from the substrate, but Makowiecki does disclose that the foil can be made on a substrate or without a substrate (col. 5, l. 10-12). Therefore, Makowiecki is open to the idea of removing the substrate because it is not necessary.

12. Kennedy discloses that it is conventional to make foils by depositing material on a substrate and later removing the substrate from the foil (col. 1, l. 7-15).

13. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Makowiecki to remove the substrate from the foil because Makowiecki recognizes that the foil can be made independent of the substrate and that Kennedy teaches that it is conventional to remove the substrate.

14. For claim 2, Applicant requires the substrate to have sufficient adherence to the layers to retain the layers during deposition, but not enough to prevent removal of the foil. For claim 5, Applicant requires a release material on the substrate. For claim 6, Applicant requires a sacrificial layer on the substrate. Makowiecki is silent on the release material or the adherence of the material to the substrate.

15. Kennedy discloses that in order to remove the foil from the substrate, a release material should be used (col. 10-22). The release agent is a sacrificial layer.

16. For claim 3, Applicant requires at least one of the layers of the foil to be aluminum in contact with the substrate. Makowiecki discloses that aluminum is the first layer deposited (col. 3, l. 6-10).

17. For claim 4, Applicant requires the substrate to comprise silicon. Makowiecki discloses that the substrate can be borosilicate glass (col. 4, l. 10-14).

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18. For claim 8, Applicant requires the vapor depositing to be PVD. For claim 9, Applicant requires the PVD to be magnetron sputtering. Makowiecki discloses that the foil is made by magnetron sputtering (col. 3, l. 17-22).

19. For claim 10, Applicant requires the substrate to be cooled during depositing. Makowiecki discloses that the substrate should be at a room temperature (col. 4, l. 26-30) or low temperature (col. 5, l. 21) and also suggests that typical techniques use deposition at high temperatures near 1000 Celsius (col. 3, l. 38-41). Kennedy discloses that the substrate should be cooled during deposition if necessary in order to maintain the temperature at the desired amount (col. 3, l. 51-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Makowiecki to cool the substrate during deposition in order to maintain the deposition temperature at room temperature.

20. For claim 11, Applicant requires the foil thickness to be 50 microns – 1 cm. Makowiecki discloses that the individual layers are 20-200 Angstroms thick (claim 6). Therefore, the total thickness is a function of the number of layers deposited and is merely an optimum value.

21. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a total thickness of 50 microns – 1 cm because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

22. For claim 12, Applicant requires the vapor depositing to minimize stress in the layers. Makowiecki discloses that their deposition method has the advantage of providing superior mechanical properties (i.e. stress) (col. 3, l. 38-49).

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Allowable Subject Matter

23. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

24. The following is a statement of reasons for the indication of allowable subject matter: it is neither anticipated nor obvious over the prior art of record to have a method of making a freestanding reactive multilayer foil as claimed by Applicant in claim 7 wherein the removable sacrificial layer is copper, brass, or photoresist.

25. Makowiecki in view of Kennedy discloses a method of making the foil using a sacrificial layer (i.e. release layer), but the release layer is a fluoride salt (col. 4, l. 37). US 4,454,379 to Cleveland et al. (Cleveland) discloses a copper release agent in a foil, but the foil does not appear to be a reactive multilayer foil composed of a plurality of alternating layers that can react exothermally. Therefore, there is no motivation to combine Cleveland with Makowiecki and Kennedy.

Conclusion

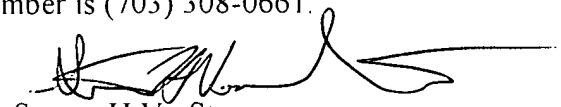
In the event that papers are missing from this communication, please contact the Customer Service Center for Technology Center 1700 at (703) 306-5665.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (703) 305-4473. The examiner can normally be reached on Mon - Thurs (7:30 AM - 6:00 PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
January 9, 2003